FRD ACTIVITIES REPORT
January 2006

Research Programs

Perfluorocarbon Tracer Analysis Capability

Work continued on the development of a perfluorcarbon atmospheric tracer analysis capability using our modified existing automated tracer gas analysis systems (ATGASs). Using a 10 mL sample loop, a range of 10 ppt-10,000 ppt could be easily analyzed. The chromatogram in Fig. 1 shows an analysis of one of the samples from the MID05 (New York City) study. Currently, the analysis time for each bag for all three analytes (PFT's) is approximately 16 minutes, or a little over 3 hours per 12-bag cartridge. Detector attenuation, carrier flow rate, column temperature, and sample volume are all being tested to optimize the system and make it as efficient as possible. Holding time studies as well as sampler studies will need to be conducted in the near future to determine if our existing sampling equipment can be used to collect PFT air samples without deleterious effects to either the data or the equipment. (Debbie.Lacroix@noaa.gov)

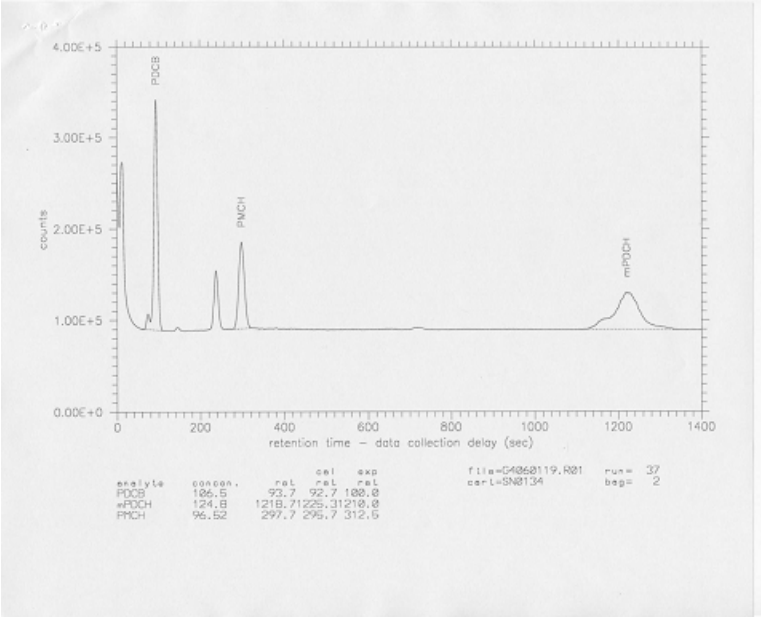

Figure 1. Chromatogram of a MID05 sample showing the PDCB, PMCH and mPDCH results.

MID05 (New York City)

Data files including the final sampler, van, and release coordinates have been created, reviewed and shared with the project manager from PNNL. Our efforts now will focus on creating a NOAA technical memorandum which will include FRD's involvement in MID05 as well as an analysis of how the atmospheric tracer plume dispersed about in a deep street canyon urban environment. It is planned that this effort will be submitted to future journal publications. (Roger.Carter@noaa.gov, Debbie Lacroix, and Jason Rich)

ET Probe

Two manuscripts related to the ET probe are now under development. A draft of the manuscript "A Pressure-Sphere Anemometer for Measuring Turbulence and Fluxes in Hurricanes" was completed in January and has now been submitted for ARL review. It is intended for submission to the *Journal of Atmospheric and Oceanic Technology*. Work has also started on a second manuscript that will be presented at the 27th Conference on Hurricanes and Tropical Meteorology, which is scheduled for April in Monterey, CA. The first paper focuses on the instrument development and design, whereas, the conference paper focuses on the data collected during Hurricanes Frances and Ivan in 2004. (Richard.Eckman@noaa.gov and Ron Dobosy, ATDD)

Smart Balloon

A conference call with smart balloon platform collaborators held during January included Bob Talbot (UNH), Steve Businger (UH), Don Troop (UNH) and John Porter (UH). Discussion items of the conference call revolved around planning and preparation of the smart balloon for the upcoming TexAQSII air quality study to be held during August and September 2006 in Houston, Texas. Six smart balloons will be built and prepared for launch during this summer's campaign.

A meeting for planning and platform coordination between other study participants will be held in Austin, Texas during the month of April (no definite date is set yet). Some of the other platforms that plan to participate are the NOAA WP-3D, the NOAA Twin Otter lidar aircraft, the NOAA research vessel Ronald H. Brown, the CIRPAS Twin Otter, and possibly the NASA J-31. (Randy.Johnson@noaa.gov)

PIGS Upgrade

A number of tests were conducted on a different type of sampling pump for use in the Programmable Integrating Gas Samplers (PIGS). The new pump is manufactured by a different company and is much more energy efficient. Unfortunately, our testing showed that they had some problems with leakage and were not suitable for use in the samplers. (Roger.Carter@noaa.gov, Randy Johnson, Debbie Lacroix)

Cooperative Research with DOE NE-ID (Idaho National Laboratory)

Emergency Operations Center (EOC)

Team A attended their first EOC requalification drill of the year on 17 January. This was an unusual drill in that it was focused on a ruptured natural gas pipe at one of the in-town INL facilities rather than the normal accident scenario of chemical or radiological release at the site. Team A provided meteorological support and operated the MDIFF transport and dispersion model as needed during the drill. (Jason.Rich@noaa.gov and Brad Reese)

Transport and Dispersion Modeling

On 19 January a presentation on the HYSPLIT dispersion model was given to the INL Emergency Response Working Group. HYSPLIT is being proposed as a replacement for the obsolescent NOAA MDIFF model currently used by FRD in its collaborative work with INL. Since HYSPLIT is widely used in NOAA, its use would not only benefit INL but would also enhance the linkages between FRD and other parts of NOAA. (Richard.Eckman@noaa.gov)

INL Mesonet

A new computer was configured to replace the aging computer system on our 915 MHz radar wind profiler. Unfortunately, it would not operate the profiler. Apparently there were some incompatibilities with the profiler controller boards and the computer bus. We will repeat the attempt with a different computer and hope for better results. (Roger.Carter@noaa.gov)

Other Activities

ARL Retreat

At the end of January, the FRD Director and Deputy Director attended an ARL retreat at ARL Headquarters in Silver Spring, MD. This retreat comes at a time of transition within ARL, with the planned retirement of Bruce Hicks as ARL Director and the changes that are under way as a result of the NOAA research review team. The main focus of the retreat was to map out strategies for future research in ARL's three core capabilities. FRD will, of course, play an important role in this future research, particularly in the Transport and Diffusion core capability where FRD provides unrivaled expertise in research related to atmospheric tracers. (Kirk.Clawson@noaa.gov, and Richard Eckman)

Safety

A Consumer Product Safety Commission recall warning was sent to all personnel that pertained to Dell rechargeable laptop computer batteries. Everyone with a Dell laptop checked their batteries, but fortunately none were on the recall list. (Debbie.Lacroix@noaa.gov)

An internet video produced by Valence was shown at the monthly staff meeting. The video shows an explosion and self-sustaining fire of lithium ion batteries. The video was shown to remind all FRD staff to be especially careful with these batteries particularly in light of the near-miss incident with lithium ion batteries last month. A discussion on safe battery charging and handling and safety was also conducted with the staff. (Debbie.Lacroix@noaa.gov)

The required monthly office safety inspection was performed following the monthly staff meeting. A list of findings was sent to all personnel with tasks assigned. Follow-up accountability on the findings will be reported in the February monthly staff meeting. (Kirk.Clawson@noaa.gov, and Debbie Lacroix)

Travel

Kirk Clawson and Richard Eckman to ARL Headquarters in Silver Spring, MD, 24-27 January 2006, to attend an ARL Retreat.

Kirk Clawson to Atlanta, GA, January 30 to February 3, 2006, to attend the 86th AMS Annual Meeting and to collaborate on future UDP (New York City) tracer experiment plans.

Training

All FRD federal and contractor personnel completed the online 2006 NOAA IT Security Awareness Course this month.

Personnel

On January 20, 2006, Dr. Dennis Finn with the University of Washington, Pullman, WA, was interviewed for the vacant Meteorologist ZP-III position. During his visit, he gave a seminar to the FRD staff on "Multifractal Analysis of Plume Concentration Fluctuations".